

under-cooling and the metastable state; diffusion in the solid state; physical properties of alloys; and electromotive force and corrosion. In chapter xiv. the construction of the equilibrium diagram is clearly explained, and the remainder of the book deals with the condition of metals in alloys, plastic deformation, the metallography of iron and steel, and the metallography of industrial alloys.

The present writer has made many notes on points in these chapters, as p. 222, "white cast-iron, martensite and cementite," instead of pearlite and cementite. The author is good on the difficult subject of hardness. P. 276, aluminium alloys have "a lower hysteresis than the purest specimens of iron . . . probably due to . . . removing oxygen." This is more likely to be due to the larger crystals formed, and the author, in such a theoretical work, might use the term "crystal" occasionally instead of "crystal grain."

In the chapter on the metallography of iron and steel there is so much that is erroneous that it is impossible to deal with it properly, but as an example the statement on p. 374 that "A tool steel containing 16 per cent. carbon, quenched from 800° C. in ice-water, consists of pure martensite," is meaningless.

The work is, however, one that every student of metallography should possess, for although there are so many points in it with which one does not agree, the author has given on the whole a fair account of theoretical matters connected with metallography, has scoured the literature of the subject, even extending to Russian, and has given copious references which must prove useful to those investigating the problems of metallography, who desire with a minimum expenditure of time to find out what has been done on their particular branch.

A. McWILLIAM.

#### PHYSIOLOGICAL CHEMISTRY.

*Practical Physiological Chemistry.* By Dr. R. H. Aders Plimmer. Pp. viii+270. (London: Longmans, Green and Co., 1910.) Price 6s. net.

THIS is really the second edition of Dr. Aders Plimmer's excellent manual. The first appearance of the book was privately printed for use in the practical classes of physiological chemistry at University College, London, but a good many copies were distributed to other teachers, and to the Press. A favourable notice of this preliminary edition appeared in the pages of NATURE at the time. The publication of the book for general sale is an indication of the way in which the teachers of the subject welcomed the new departure in the presentation of the subject. For it is a new departure; hitherto works on the subject have been written by physiologists; the present book is written by a chemist; it is physiological chemistry as opposed to chemical physiology.

The increasing exactitude of knowledge in the chemistry of those carbon compounds which are the constituents or products of living matter warrants the appearance of a book written to show that physiological chemistry is only a branch of organic chemistry, and Dr. Aders Plimmer has been successful in showing the connection of the two by the insertion of the appropriate and logical links which unite the intro-

ductory chapters on organic chemistry proper with its daughter science.

The main aim of the work is to make it a trustworthy practical guide, and no laboratory worker can afford to be without it. Its ideal is that every student shall work through all the exercises; these are set out with detail and in a clear manner, so that there is no reason why the student should fail to do so under his teachers, except that of time, and time is a very important factor for students of medicine, to whom the work is primarily addressed. In the medical curriculum, the number of subjects is growing every year, and each one of these is expanding and seeking to encroach more and more on the unfortunate student's already too-full day. Teachers are already seeking means to limit in particular certain preliminary subjects, and to exclude those portions which have but little direct bearing on his future practical life. There is no subject, however, which has such a direct bearing on medical practice as physiological chemistry; its relationships to pathology become clearer with every advance in knowledge; if there is one subject more than any other which should not be curtailed, that subject is physiological chemistry.

W. D. H.

#### SYSTEMATIC BOTANY.

*Das Pflanzenreich. Regni vegetabilis conspectus.* Edited by A. Engler. Vol. iv., pt. 104. *Papaveraceae-Hypecoideae et Papaveraceae-Papaveroideae.* By Friedrich Fedde. Pp. 430. (Leipzig: W. Engelmann, 1909.) Price 21.60 marks.

THIS volume forms the fortieth part of the great series of monographs in course of publication under Dr. Engler's editorship. It comprises the family Papaveraceae as understood in the restricted sense, that is, without the Fumariaceae; the account of these will be issued subsequently as Papaveraceae-Fumarioideae. The special portion of the work, the systematic treatment of genera and species, is preceded by a general account of the family occupying eighty-three pages, in which Dr. Fedde discusses the morphology and anatomy of the vegetative organs, with special reference to the value for systematic purposes of the anatomical characters; the position of the laticiferous vessels and the character of the latex is found most helpful in this respect. The floral structure and its modifications are discussed at considerable length, and also the fruit, especially the various mechanisms of dehiscence. There is also a useful section on geographical distribution, a discussion of the affinities of the family, and an account of its economic uses.

The great value of these monographs lies, however, in the systematic portion, which should represent the results of the work of an expert student of the family on all the available material. Dr. Fedde is known as an authority on the Papaveraceae, and we look to his monograph for a careful and considered systematic presentation of the family. It is somewhat surprising therefore to note the treatment of the earlier genera of Papaveroideae which, as *Platystemon* and *Eschscholtzia*, are confined to Pacific North America. In

Bentham and Hooker's "Genera Plantarum," these genera are credited with one and four to five species respectively, and while we might expect some increase in the number of known species since the date of issue of that volume, it is with somewhat of a shock that we find *Platystemon* credited with fifty-five and *Eschscholtzia* with 123 species. In *Platystemon* forty-nine of the species are of Greene and six of Fedde, in *Eschscholtzia* 104 of Greene and twelve of Fedde. Prof. E. L. Greene, we believe, holds views as to the origin of species which do not accord with those generally accepted, and these views are no doubt responsible for the description of species based on characters which might otherwise be regarded as representing mere variants of a single species. Dr. Fedde has not only adopted Dr. Greene's estimate, but added to the number. He perhaps shrank from the difficult task of reducing the species to more workable proportions, and took the path of least resistance. The result is, however, an increase in the number of those genera, which, like *Cratægus* in America, and *Rubus* in the Old World, have been rendered hopelessly unworkable by any but the most devoted expert. This method of treatment of some of the genera leads to a want of uniformity in the work as a whole. Thus under the common poppy, *Papaver rhoeas*, are twenty-six varieties and subvarieties, which probably have as good claim to specific distinction as the "species" of *Platystemon*.

In dealing with the genera of *Chelidoniæ*, Dr. Fedde has followed the limitation of species accepted by Dr. Prain, though he does not adopt his reduction of several of the genera, *Dicranostigma*, *Hylomecon*, and others, to subgeneric rank under *Chelidonium*. On the whole, however, Dr. Fedde shows a disinclination to differ from authority which we do not expect from the expert who has exhaustively surveyed the entire field of a large natural order. Thus under *Meconopsis*, while accepting Dr. Prain's sections, he suggests with regard to two of these, *Aculeatæ* and *Primulinæ*, that the division is not a natural one.

As regards the presentation of genera and species, the descriptions are full, the synonymy and geographical distribution are carefully worked out, and collections and numbers are largely cited. The index is a good one, but would be improved by the repetition of the genus name at the head of each column, thus avoiding the necessity for turning back to find the genus to which the species names belong.

A. B. R.

#### OUR BOOK SHELF.

*Woodcraft for Scouts and Others.* By O. Jones and M. Woodward. Pp. 156. (London: C. Arthur Pearson, Ltd., 1910.) Price 2s. net.

THAT the present generation of country people do not study woodcraft and field-lore with the zest and thoroughness of their forefathers, is a regrettable fact too well known to all capable of forming an opinion on the subject. The nature-knowledge of the old-fashioned shepherd has been replaced by a superficial education of a different class, which is of little or no use to its possessor, and the intimate knowledge of the creatures of the forest, field, and stream owned by the professional poachers of a generation ago has to a

considerable extent vanished with the diminution in the numbers of that class in many districts. Nor is this all, for ordinary country lads, in some counties at any rate, show a lamentable lack of knowledge of the names of wild plants and birds as compared with their grandfathers. That the scout movement, if properly conducted will do something to improve this state of affairs in the case of the rising generation is almost certain, for it is obvious that to orient one's position in a wood at night, to follow the trail of a suspect, or to escape the attentions of an enemy is impossible without a full knowledge of woodcraft in its widest sense.

As an aid to knowledge of this nature, the excellent little volume by Messrs. Jones and Woodward is very opportune, if only it reaches the class for which it is primarily intended. Both authors appear to have a thorough grasp of their subject, and the amount of information contained in their work is little less than marvellous. In the tenth chapter there is perhaps a little too much tendency to convert the young scout into a rabbit poacher, and the expression on p. 136, "to break the law of trespass," is an indication that the authors are not so well versed in the common law of their own country as they might be. In treating of the animals and plants of the countryside, the authors are just as much at home as when discussing old-fashioned country remedies, or the difference between wholesome and noxious funguses, and their work as a whole leaves little or nothing to desire in the matter of completeness and thoroughness.

R. L.

*A School Course of Heat.* By R. H. Scarlett. Pp. xvi+300. (London: Longmans, Green and Co., 1910.) Price 3s. 6d.

THIS book is intended for the use of students who have already passed through an elementary course in general physics. The author devotes the first thirty pages of the present volume to a recapitulation of the elementary portions of heat. The rest of the book deals with the more advanced parts of the subject and touches briefly upon some points which do not usually find a place in a school text-book.

The subject is developed throughout along the line of practical work in the laboratory, but we do not think the laboratory experiments are always well chosen. In dealing with the errors of mercury thermometers on p. 18, the author states that mercury is not quite uniform in its expansion, and near 50° C. on the scale, there will be a constant error amounting to almost a degree. This error, of course, will depend upon the glass, but one-tenth of a degree is nearer the average correction necessary from this cause. The method employed on p. 62 to obtain the relation between the density of a liquid at different temperatures and its coefficient of expansion will present difficulty to an elementary student, and it is certainly not sufficiently accurate for all experiments as performed in the laboratory. Thus, in the example given on pp. 64, 65, there is an error of 3 per cent. in the calculated coefficient due to the use of this approximate formula.

Similarly, in the treatment of coefficient of absolute expansion on p. 70, it is not made clear to the reader which column length is involved in the denominator of the expression obtained. The wrong one is measured in the illustrative example, making a 1½ per cent. error in the result. The hydrostatic method is a most unsuitable one to employ for the expansion coefficient of ether between 10° and 30°, as given on p. 66. On p. 191 we are told that the steam and hoarfrost lines intersect at 0° C. The chapter on thermal conductivity would have been improved by